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10/602,952	06/24/2003	Brandon R. Bray	MSFT-1650/302481.1	1053

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WOODCOCK WASHBURN LLP (MICROSOFT CORPORATION)
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER	
ANYA, CHARLES E	

ART UNIT	PAPER NUMBER
2194	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/602,952	BRAY ET AL.	
	Examiner	Art Unit	
	Charles E. Anya	2194	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3/* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-12,14-23 and 25-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-12,14-23 and 25-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1,3-12,14-23, and 25-35 are pending in this application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,12 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Protected error handling for microprocessor-based systems to Disclosed Anonymous (hereinafter referred to as Anonymous pages 1-2).

3. As to claim 1, Anonymous teaches a method of validating and dispatching an event , comprising: generating a list of valid exception handlers, said list of valid exception handlers located in a protected area during program execution (Ram Vector Table 3 page 2); receiving an event ("…detects that an exception has occurred…" page 2); determine an exception handler for the event ("…invoke an appropriate exception handler…" page 2); determining if the exception handler is valid by comparing the exception handler to said list of valid exception handlers ("…checks…validity checks…" page 2) and determining if the exception handler is unaltered ("…errant writes…" page 2); otherwise determining that the exception handler is invalid ("If the validity checks

fails…" page 2); and executing the exception handler if the exception handler is valid ("…if so…" page 2).

4. As to claims 12 and 23, see the rejection of claim 1 above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1,12, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Pub. No. 2004/0133777 A1 to Kiriansky et al.

6. As to claim 1, Kiriansky teaches a method of validating and dispatching an event (figures 9/10), comprising: generating a list of valid exception handlers, said list of valid exception handlers located in a protected area during program execution ("…unmodified page list…" page 3 paragraph 0071, Step 412/430/431 page 8 paragraph 0197); receiving an event (page 5 paragraph 0115); determine an exception handler for the event (page 5 paragraph 0116); determining if the exception handler is valid by

comparing the exception handler to said list of valid exception handlers ("…considered valid instructions…Execute an instruction if it was present when the application or library image was originally loaded…" page 3 paragraph 0070-0074, xxx page 4 paragraphs 0067/0070) and determining if the exception handler is unaltered ("Execute an instruction if it was present when the application or library image was originally loaded…" page 3 paragraph 0070-0074…and instruction was never modified…" page 3 paragraph 0072, page 8 paragraph 0190, page 9 paragraph 0210); otherwise determining that the exception handler is invalid ("If no matching…" page 4 paragraph 0090, page 9 paragraph 0210); and executing the exception handler if the exception handler is valid ("If a matching…" page 4 paragraph 0090, page 9 paragraph 0211).

7. As to claims 12, and 23, see rejection of claim 1 above.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1,3,4,7-15,18-23,25,29-31,34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2004/0064712 A1 to Arthur et al. in view of U.S. Pat. No. 7,243,340 B2 to Tobin.

10. As to claim 1, Arthur teaches a method of validating and dispatching an event (figures 3A/3B/4), comprising: generating a list of valid exception handlers, said list of valid exception handlers is located in a protected area during program execution ("…substitute and non-substitute exception handlers…" page 3 paragraph 0047, Step 105 page 4 paragraph 0053); receiving an event (Step 111 page 4 paragraph 0055, Step 151 page 4 paragraph 0069); determining if the exception handler is valid by comparing the exception handler to said list of valid exception handlers (Step 113 page 4 paragraph 0056, Step 153 page 4 paragraphs 0067/0070) and determining if the exception handler is unaltered ("…check whether any component or instructions have been tampered with…" page 3 paragraph 0047, page 4 paragraph 0056, page 4 paragraph 0070); otherwise determining that the exception handler is invalid ("…if so…" page 4 paragraph 0067, Step 155 "…not OK…" page 4 paragraphs 0070/0071); and executing the exception handler if the exception handler is valid (Step 115 page 4 paragraph 0057, "…sent to 151…" page 4 paragraph 0070).

Arthur is silent with reference to determining an exception handler for the event.

Tobin teaches determining an exception handler for the event (Step 713 Col. 9 Ln. 42 – 45, Step 813 Col. 10 Ln. 8 – 10).

It would have obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Arthur with teaching of Tobin because the combination would achieve a predictable result of selecting appropriate exception handler for a particular exception.

11. As to claim 3, Tobin teaches to the method of claim 1, further comprising one of receiving the list of valid exception handlers (Col. 9 Ln. 25 – 35).

12. As to claim 4, Arthur teaches the method of claim 1, further comprising retrieving a list of valid exception handlers from a storage device and comparing the exception handler to the list of valid exception handlers in determining if the exception handler is valid (Step 113 page 4 paragraph 0056, Step 153 page 4 paragraphs 0067/0070).

13. As to claim 7, Tobin teaches the method of claim 1, further comprising, if the exception handler is valid, determining whether the exception handler handles the event (Step 713 Col. 9 Ln. 43 – 48, Step 813 Col. 10 Ln. 8 – 10), and if so, executing the exception handler, and otherwise, retrieving a second exception handler from information on a stack and continuing processing with determining if the second exception handler is valid (Step 717 Col. 9 Ln. 45 – 48, Step 817 Col. 10 Ln. 10 – 12).

14. As to claim 8, Arthur teaches the method of claim 1, further comprising terminating the method if the handler is invalid ("…terminated…" page 3 paragraph 0047, Steps 119/155 page 4 paragraphs 0059/0071).

15. As to claim 9, Arthur teaches the method of claim 1, further comprising generating an error message if the handler is invalid (Steps 119/153 page 4 paragraphs 0059/0071).

16. As to claim 10, Tobin teaches the method of claim 1, further comprising, if the exception handler is valid, verifying other data for the event ("…pointer…" Col. 9 Ln. 49 – 59).

17. As to claim 11, Tobin teaches the method of claim 10, wherein the other data comprises pointer data ("…pointer…" Col. 9 Ln. 49 – 59).

18. As to claims 12,15,18-22, see the rejection of claims 1,4 and 7-11 respectively.

19. As to claim 14, see the rejection of claim 3 above.

20. As to claims 23 and 25, see the rejection of claims 1 and 4 respectively.

21. As to claims 29-31, see the rejection of claims 7-9 respectively.

22. As to claims 34 and 35, see the rejection of claims 10 and 11 respectively.

23. **Claims 5,16,26,27 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2004/0064712 A1 to Arthur et al. in view of U.S. Pat. No. 7,243,340 B2 to Tobin as applied to claims 1,23 or 26 above, and further in view of U.S. Pat. No. 5,628,016 to Kukol.**

24. As to claim 5, Tobin and Arthur are silent with reference to teaches the method of claim 1, further comprising generating a list of valid exception handlers by compiling code into at least one of an object file and an image.

Kukol teaches the method of claim 1, further comprising generating a list of valid exception handlers by compiling code into at least one of an object file and an image (figure 1C Col. 8 Ln. 62 – 67, Col. 9 Ln. 1 – 16).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system Tobin and Arthur with the teaching of Kukol because the teaching of Kukol would improve the system of Tobin and Arthur by providing a uniquely efficient, portable and flexible implementation of exception handling (Kukol Col. 16 Ln. 15 –23).

25. As to claims 16 and 26, see the rejection of claim 5 above.

26. As to claim 27, Arthur teaches the system of claim 26, further comprising a storage device that store the list of valid exception handlers ("…storage medium…" page 5 claim 1).

27. As to claim 32, Kukol teaches the system of claim 23, further comprising a linker that creates an image based on at least one object file received from at least one of a compiler and an assembler, and provides the image to the exception dispatcher system (figure 1C Col. 8 Ln. 62 – 67, Col. 9 Ln. 1 – 16).

28. Claims 6,17 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2004/0064712 A1 to Arthur et al. in view of U.S. Pat. No. 7,243,340 B2 to Tobin as applied to claims 1,12 and 23 above, and further in view of U.S. Pub. No. 20020169999 A1 to Bhansali et al.

29. As to claim 6, Tobin and Arthur are silent with reference to the method of claim 1, further comprising compiling code to produce an executable that is marked with an identifier indicating that the executable is safe with respect to a list of valid exception handlers.

Bhansali teaches the method of claim 1, further comprising compiling code to produce an executable that is marked with an identifier indicating that the executable is safe with respect to a list of valid exception handlers (figure 14 Handler Designation 1408 page 12 paragraphs 0163/0164).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Tobin and Arthur with the teaching of Bhansali because the teaching of Bhansali would improve the system of Tobin and Arthur by providing a process for identifying an appropriate exception handler for handling an exception (Bhansali page 12 paragraph 0163).

30. As to claims 17 and 28, see the rejection of claim 6 above.

31. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over 3,5,14,16,26,27 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2004/0064712 A1 to Arthur et al. in view of U.S. Pat. No. 7,243,340 B2 to Tobin and further in view of U.S. Pat. No. 5,628,016 to Kukol as applied to claim 32 above, and further in view of U.S. Pub. No. 20020169999 A1 to Bhansali et al.

32. As to claim 33, Kukol, Tobin and Arthur are silent with reference to the system of claim 32, wherein the linker produces an executable that is marked with an identifier indicating that the executable is safe with respect to a list of valid exception handlers.

Bhansali teaches the system of claim 32, wherein the linker produces an executable that is marked with an identifier indicating that the executable is safe with respect to a list of valid exception handlers (figure 14 Handler Designation 1408 page 12 paragraphs 0163/0164).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Kukol, Tobin and Arthur with the teaching of Bhansali because the teaching of Bhansali would improve the system of Kukol, Tobin and Arthur by providing a process for identifying an appropriate exception handler for handling an exception (Bhansali page 12 paragraph 0163).

Response to Arguments

Applicant's arguments with respect to claims 1,3-12,14-23 and 25-35 have been considered but are moot in view of the new ground(s) of rejection.

Response to Arguments

Applicant's arguments filed 12/27/07 have been fully considered but they are not persuasive.

Applicant argues in substance that the Arthur prior teaches away from protecting valid exception handler from alteration during program execution.

After careful review of Applicant's invention as claimed and the Arthur prior art the Examiner concludes that the Arthur prior does not teach away from protecting valid exception handlers from alteration during program execution. Contrary to Applicant assertion the Arthur prior art discloses a general-purpose computer executing tamper-resistant software (TRS). To prevent debugging or alteration of the TRS while it is executing, exception handlers that could be used by software debuggers or hackers are replaced by substitute exception handlers. Instrumented exceptions are occasionally

caused by the TRS, and if these exceptions are not correctly handled by the substitute exception handlers, execution of the TRS may be terminated. **To verify** that the substitute (and non-substitute) exception handlers have not been tampered with by rogue software, the instructions of the exception handlers may be **occasionally read and checked**, and if any instruction has been changed, the TRS may be terminated.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Pub. No. 2004/0168078 A1 to Brodley et al.: directed to a process for protecting function return address.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles E. Anya whose telephone number is (571) 272-3757. The examiner can normally be reached on M-F (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Thomson can be reached on (571) 272-3718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Charles E Anya
Examiner
Art Unit 2194

cea.

/VAN H NGUYEN/
Primary Examiner, Art Unit 2194